

ABSTRACT OF THE DISCLOSURE

There is provided a manufacturing apparatus and method able to manufacture a phase shift mask blank in which 5 a total number of particles and pinholes having a diameter larger than about a half of an exposure wavelength in a light semi-transmission film is 0.1 or less per square centimeter. In a DC magnetron sputtering apparatus for manufacturing a halftone phase shift mask blank, for example, a target plane 10 is disposed downwards with respect to a gravity direction, a whole-surface erosion cathode is used, a corner portion 5a of an end of a target and a corner portion of an earth shield are chamfered (R processed), a target end 5b, an exposed backing plate surface 4b and the surface of an earth shield 15 12 are roughened, and the earth shield 12 is disposed above a target plane d (on a backing plate side).